Front on the Move

Use weather data to track an approaching cold front.

E.7.9A "Students will demonstrate an understanding of how complex changes in the movement and patterns of air and water molecules caused by the sun, winds, landforms, ocean temperatures..."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline two clues that show how the front is moving. Circle two clues that help you predict where rain may fall next.

A Changing Afternoon

1 At 8 a.m., a line of clouds stretches north to south between Westport and Eastport. A cold air mass is pushing east beneath a warm, moist air mass. As warm air rises, water vapor cools and condenses into cloud droplets. If enough droplets join, rain falls near the boundary, called a cold front.

2 A satellite image shows the cloud line moving east. Radar detects rain along the line but cannot measure how people feel on the ground. Station instruments record temperature, moisture, and air pressure at different times. The table reports a short sequence from these instruments and radar. Compare changes at each town before predicting what comes next.

WEATHER OBSERVATIONS

Time and place	Air and pressure	Radar rain
8 a.m., Westport	Warm, humid; pressure falling	None
Noon, Westport	Cool, dry; pressure rising	Ending
Noon, Eastport	Warm, humid; pressure falling	None

3 A rainy afternoon does not tell a town's climate. Climate describes the usual pattern of weather over many years. Westport lies beside a cool ocean current, which often keeps its summers mild. A nearby inland valley usually has hotter summers because it lacks that cooling influence. Today's front may change both places' weather, but one front cannot establish their climates.

2 ANSWER WITH EVIDENCE

Use the passage

1. What evidence shows that the cold front passed Westport between 8 a.m. and noon?

2. What weather might Eastport have after noon? Use the observations and the front's direction to explain your prediction.

3. How do the satellite and radar provide different evidence for predicting rain near Eastport?

4. Which describes Westport's climate: its mild summers or rain on one afternoon? Explain what helps cause that climate pattern.

3 YOUR TURN

Your own words

Harborview lies beside a warm ocean current, while an inland town at the same latitude is far from the sea. A cold air mass moves toward Harborview's warm, moist air: write three sentences predicting Harborview's short-term weather, explaining the movement of air and water, and comparing the towns' likely winter climates.

ANSWER KEY

Front on the Move

GRADE 7 · E.7.9A

PART 1 · READ AND MARK

Underline two clues that show how the front is moving. Circle two clues that help you predict where rain may fall next. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	What evidence shows that the cold front passed Westport between 8 a.m. and noon?	**Westport changed from warm, humid air and falling pressure to cool, dry air and rising pressure. Radar showed rain ending at noon.**
2	What weather might Eastport have after noon? Use the observations and the front's direction to explain your prediction.	**Eastport may get clouds and rain, followed by cooler, drier air. The front is moving east, and Eastport still has warm, humid air and falling pressure at noon.**
3	How do the satellite and radar provide different evidence for predicting rain near Eastport?	**The satellite shows the cloud line moving east toward Eastport. Radar shows rain along that line, so rain may move toward Eastport too.**
4	Which describes Westport's climate: its mild summers or rain on one afternoon? Explain what helps cause that climate pattern.	**Mild summers describe climate because they are a usual pattern over many years. The nearby cool ocean current helps keep Westport's summers mild.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

As cold air reaches Harborview, warm, moist air rises and cools, so clouds and rain may form. After the front passes, Harborview may become cooler and drier. Over many winters, Harborview may be milder than the inland town because the warm ocean current warms the nearby air.

Accept forecasts that use the eastward movement of the front and the observations at both towns as evidence. For the open task, accept a reasonable climate comparison that distinguishes a long-term pattern from one front's effects.